Forest Genetics Council of BC
Business Plan 2010 – 2011

Compiled and edited by

Jack H. Woods

FGC Program Manager

Message from the FGC Co-Chairs

We are pleased to present the Forest Genetics Council's 2010/11 Business Plan. This plan outlines activities and budgets prepared by the Forest Genetics Council of BC (FGC), and its technical advisory committees, for implementing the forest Land Base Investment Strategy (LBIS) Tree Improvement Program. This is the tenth consecutive Business Plan of the FGC, and was made possible through the co-operative effort by many people in government, the private sector, and universities throughout the province. Also noteworthy is the ongoing support for tree improvement by Minister of Forests, the honourable Pat Bell, and provincial Chief Forester, Jim Snetsinger.

This Business Plan outlines a balanced set of activities in support of a collaborative provincial tree improvement and forest genetic resource management program, including select seed production, tree breeding, genetic conservation, cone and seed pest management, technical support, and extension. Significant effort is also being put towards response to climate change through a better understanding of the patterns of natural genetic diversity found in commercial tree species, and the matching of this genetic diversity with current and anticipated future climates. This is the second year of a separate subprogram structured to address these issues in support of the full development of province-wide climate-based seed transfer standards.

Timber supply gains through silviculture investments are identified in the Ministry of Forests and Range service plan and in LBIS objectives. Tree improvement is expected to supply over half of these gains. The importance of this program, and of the need to continue to deliver a streamlined and cooperative set of activities with participation by all sectors, is very clear. In times of fiscal restraint, staff changes, and economic down-sizing within the forestry sector, however, it is difficult to align resources, people, and programs for efficient delivery. Budget delays have created challenges for projects with biological time-lines, and staff changes are resulting in the loss of expertise and continuity in some parts of the provincial program. Despite these issues, however, the FGC continues to lead a provincial program that is on track for most objectives, including increases to the production, use, and genetic worth levels of seed from select (orchard; class A) sources.

The success of this program is dependent upon the dedication, hard work, knowledge-sharing, and cooperation of members of Council and its affiliated committees, including staff from the Ministry of Forests and Range, industry, universities, and other government agencies. Their respective contributions are greatly appreciated, and we would like to recognize and thank all involved as we head into another year of collaborative program delivery.

Kerry McGourlick, RPF
FGC Co-chair
Western Forest Products Ltd.

Brian Barber, RPF
FGC Co-chair
Ministry of Forests and Range

Budgets list allocations of funds provided by the provincial Land Base Investment Strategy Tree Improvement Program

Budgets in this Business Plan were approved
by the Forest Genetics Council of BC on
June 16, 2010

Compiled and edited by
Jack Woods
FGC Program Manager

Table of Contents

Message from the FGC Co-Chairs i
List of Figures ii
List of Tables ii

1.0 Introduction 1
1.1 Forest Genetics Council of BC 1
1.2 A Co-operative Effort 2
1.3 Land Base Investment Strategy; Tree Improvement Program 2

2.0 Process for Business Plan Development 3
2.1 The Role of Council and its TACs 3

3.0 Subprogram Planning and Management 6
3.1 Genetic Conservation Subprogram 6
3.2 Tree Breeding Subprogram 7
3.3 Operational Tree Improvement Program (OTIP) 8
3.4 Expansion of Orchard Seed Supply Subprogram (SelectSeed Co. Ltd.) 9
3.5 Extension and Communication 14
3.6 Genetic Resource Decision Support Subprogram 15
3.7 Cone and Seed Pest Management Subprogram 16
3.8 Genecology and Seed Transfer Subprogram 17
3.9 Administration 19
3.10 Incremental Projects 19
3.11 Budget Summary 20

4.0 Funding and Administrative Mechanisms 21
4.1 Funding Agreements 21
4.2 Monitoring and Reporting 22

Appendix 1: Seed Planning Units and Categories 24

Appendix 2: Forest Genetics Council and Technical Advisory Committee Members 26

Appendix 3: Species Plans 28

List of Figures

Figure 1 Relationship between the FGC Strategic Plan, Land Base Investment Strategy Tree Improvement Program, and business plan development through FGCM subprograms. 3

Figure 2 Link between FGC objectives, planning processes, and the subprograms of the FGC Business Plan 5

Figure 3 Organizational relationships among SelectSeed Ltd., Land Base Investment Program, Forest Genetics Council, and the B.C. Forest Genetics Society 9

Figure 4 Administrative mechanisms for the delivery of the LBIS Tree Improvement Program funding. 21

Figure 5 Work breakdown structure for program administration, monitoring and management 22

List of Tables

Table 1 Conservation subprogram budget for 2010/11.. 7

Table 2 2010/11 budgets ($ x 1000) and KPI by seed planning unit for tree breeding and associated technical support activities 10

Table 3 2010/11 budgets ($ x 1000) and KPI by seed planning unit for OTIP projects. 11

Category numbers relate to the Work Breakdown Structure shown in Figure 5. See species plans (Appendix 3) for SPU detail. 11

Table 4 SelectSeed Company Ltd. 2010/11 budget by category 13

Table 5 Orchards under contract to SelectSeed Company Ltd. 13

Table 6 Extension and communication projects and budgets for 2010/11 15

Table 7 Cone and Seed Pest Management Subprogram projects for 2010/11. 16

Table 8 Genecology and Seed Transfer Subprogram projects, recommended funding, and performance indicators (KPI) ($ x 1000) 18

Table 9 2010/11 incremental projects and budgets ($ x 1000). 20

Table 10 2010/11 budget summary for LBIS Tree Improvement Program contributions to subprograms ($ x 1000). 20

Table 11 List of reports, responsibilities, distribution, and preparation dates for FIA-supported Tree Breeding, OTIP, Genecology and Seed Transfer, and SelectSeed projects. 23

1.0 Introduction

This section overviews the relationship between the multi-stakeholder Forest Genetics Council and its co-operators in the planning and implementation of forest genetic resource management activities in British Columbia, and for the management and allocation of funds under the Land Base Investment Strategy (LBIS) Tree Improvement Program.

1.1 Forest Genetics Council of BC

The Forest Genetics Council of BC (FGC) is a multi-stakeholder group representing the forest industry, Ministry of Forests and Range (MFR), universities and the Canadian Forest Service. Council's mandate is to lead a provincial tree improvement and forest genetic resource management (GRM) program that encompasses the conservation, controlled use, and value-enhancement of the genetic resources of forest tree species, and to advise the Provincial Chief Forester on forest genetic resource management policies.

The FGC provides a forum for stakeholder representatives to set objectives and to oversee the development and delivery of a Business Plan to fulfill these objectives. The vision statement and objectives set out in the FGC Strategic Plan for the period 2009 to 2014, are:

Vision statement:

BC's forest genetic resources are diverse, resilient, and managed to provide multiple values for the benefit of present and future generations.

Objectives:

1. Adequately conserve the genetic diversity of key populations of all forest tree species native to BC by 2015, through a combination of in situ, ex situ, and inter situ conservation.
2. By 2020, high-quality genecology research information will guide operationally efficient climate-based seed transfer policy and practice for all trees planted in BC.
3. Increase the average volume gain of select seed used for Crown land reforestation to 20% by the year 2020.
4. Increase select seed use to 75% of the provincial total sown by 2014.
5. Coordinate stakeholder activities and secure the resources needed to meet Business Plan priorities.
6. Monitor and report progress in genetic resource management activities.

This Business Plan defines the annual set of activities and budgets needed to achieve these objectives.

1.2 A Co-operative Effort

Forest genetic resource management in BC is a co-operative effort. The MFR leads tree breeding activities, while both private industry and the MFR manage seed orchards for the operational production of select seed. Genecology research is undertaken by the MFR and by universities in support of seed transfer policy, climate-change response, and genetic conservation. Research in the areas of pest management and other GRM activities is carried out by universities, the MFR Research Branch, and the Canadian Forest Service. Policy development for Crown lands is the responsibility of the MFR, with advice provided to the Provincial Chief Forester through the FGC.

1.3 Land Base Investment Strategy; Tree Improvement Program

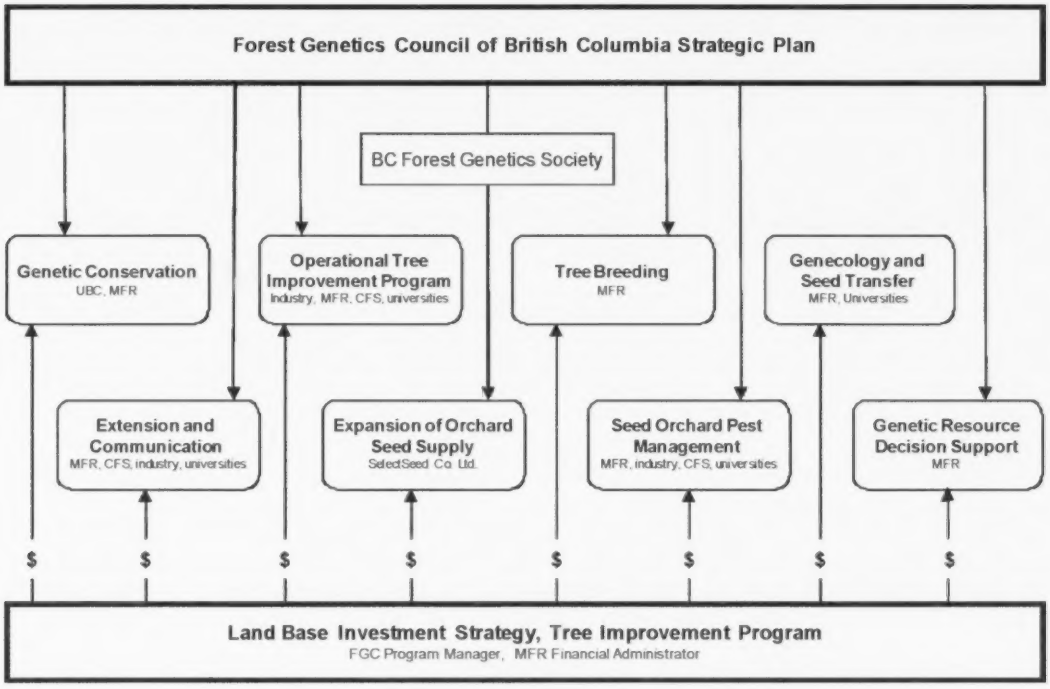
Beginning this fiscal year, the LBIS consolidates other provincial land base investment funds managed by the MFR, including the Forest Investment Account, to ensure funding is directed to priorities set by the provincial government. The LBIS seeks to encourage investments in the forest resource that maximize productivity and value while supporting forest resilience. The Tree Improvement Program supports specific implementation priorities related to timber supply, fast-growing forests, and adaptation to climate change.

LBIS objectives call for 7.1 million cubic meters of additional timber supply provincially in 65 years. Of this, 4.3 million cubic meters are expected to be provided through the LBIS Tree Improvement Program. Investments to meet this objective are made in accordance with program and budget recommendations developed by the FGC through an annual business planning process. FGC objectives are aligned with MFR objectives, and are set out in the FGC Strategic Plan for 2009 to 2014. The MFR administers funding through the subprogram areas identified in the FGC Strategic and Business Plans (Figure 1).

Business planning carried out through the existing FGC-led process, includes Technical Advisory Committees (TACs) undertaking specific planning activities, developing budgets, and making operational recommendations (Figure 2). The FGC reviews and makes final recommendations for subprogram budgets and activities, and ensures the overall program meets MFR and LBIS objectives and administrative requirements. The program is managed and coordinated by the FGC Program Manager on behalf of the FGC, with substantial input from FGC Co-Chairs, Technical Advisory Committee (TAC) Chairs, and others.

In addition to LBIS Tree Improvement Program investments and MFR direct program investments through staff and in-kind support, private companies also fund activities under Council's Business Plan. The species plans found in Appendix 3 outline general strategy, predict orchard seed production and gain, summarize conservation status, and provide key seed-use and availability statistics for individual species and seed-zone combinations known as seed planning units (SPU).

Figure 1 **Relationship between the FGC Strategic Plan, Land Base Investment Strategy Tree Improvement Program, and business plan development through FGCM subprograms.**



2.0 Process for Business Plan Development

2.1 The Role of Council and its TACs

FGC members, representing the MFR, forest companies, universities, and the Canadian Forest Service, provide strategic direction to the provincial forest genetic resource management program. FGC Technical Advisory Committees provide technical and policy information to Council and contribute to the development of FGC plans and associated budgets. The FGC Business Plan consolidates the subprogram plans and budgets into a comprehensive set of activities that address Council's objectives.

Council's seven TACs lay the groundwork for the FGC Business Plan:

- The Coastal and Interior TACs, through their Species Committees, review and advise on Species Plans (Appendix 3) that outline strategy and activities for the Tree Breeding, Operational Tree Improvement Program (OTIP), and the Expansion of Orchard Seed Supply (SelectSeed Company Ltd.) subprograms.
- The Genetic Conservation TAC (GCTAC) advises Council on issues related to genetic conservation and genetic diversity, and identifies required activities and budgets under the Genetic Conservation Subprogram.

- The Seed Transfer TAC develops strategy and activities for genecology research and climate-based seed transfer policy .
- The Extension TAC (ETAC) is responsible for developing a strategy and annual activity plans for the Extension and Communication Subprogram.
- The Pest Management TAC (PMTAC) identifies information and research needs, and guides both research and extension activities for the control of insect and disease pests impacting seed orchards and seed production.
- The Genetic Resources Decision Support Steering Committee oversees the development of activities and budgets for the Genetic Resource Decision Support Subprogram.

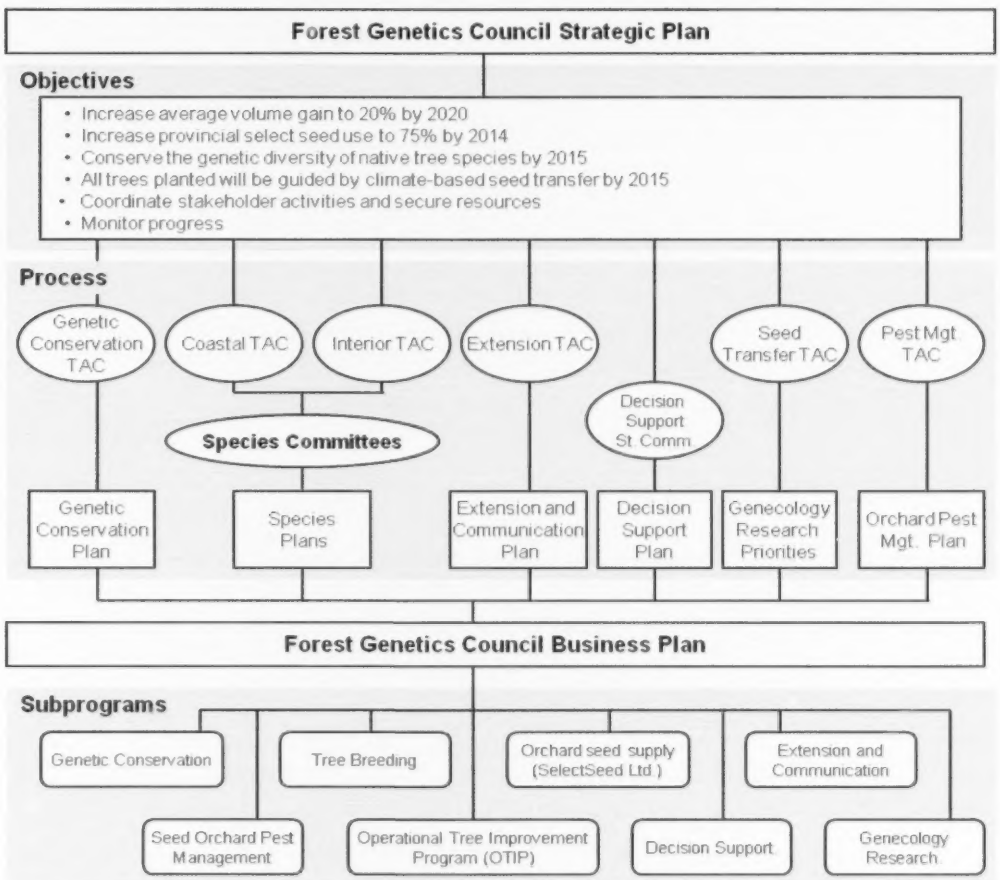
In addition to the seven advisory committees, Council establishes other committees as needed to advise on shorter-term projects.

Program financial administration is led by the MFR Tree Improvement Branch. Program management, including business plan and annual report compilation, is led by SelectSeed Company Ltd. (SelectSeed), on behalf of Council.

Council reviews all strategies, plans, or recommendations from it's TACs and from SelectSeed for approval (or revision) before incorporating them into the FGC Business Plan. Figure 2 illustrates this hierarchical structure and the link between FGC objectives, planning processes, and the seven subprograms through which it is implemented.

The process by which the Council Subcommittees or other agencies define activities and budgets for each subprogram is discussed in Section 3. As it is difficult to accurately predict project spending, subprogram leaders are authorized to reallocate funds within their subprograms as necessary throughout the fiscal year, subject to limits and review process.

Figure 2 Link between FGC objectives, planning processes, and the subprograms of the FGC Business Plan


Forest Genetics Council Strategic Plan
Objectives
• Increase average volume gain to 20% by 2020
• Increase provincial select seed use to 75% by 2014
• Conserve the genetic diversity of native tree species by 2015
• All trees planted will be guided by climate-based seed transfer by 2015
• Coordinate stakeholder activities and secure resources
• Monitor progress
Process
Genetic Conservation TAC
Coastal TAC
Interior TAC
Extension TAC
Seed Transfer TAC
Pest Mgt TAC
Species Committees
Decision Support St. Comm
Genetic Conservation Plan
Species Plans
Extension and Communication Plan
Decision Support Plan
Genecology Research Priorities
Orchard Pest Mgt. Plan
Forest Genetics Council Business Plan
Subprograms
Genetic Conservation
Tree Breeding
Orchard seed supply (SelectSeed Ltd.)
Extension and Communication
Seed Orchard Pest Management
Operational Tree Improvement Program (OTIP)
Decision Support
Genecology Research

3.0 Subprogram Planning and Management

3.1 Genetic Conservation Subprogram

Genetic conservation activities monitor and catalogue genetic resources for indigenous-tree species, research conservation methods and needs, provide background genecology information for non-commercial species, and provide guidance on policy development.

3.1.1 Planning

Genetic conservation activities are developed through the FGC Genetic Conservation TAC (GCTAC), with programs and spending approved by the FGC.

3.1.2 Management

Subprogram delivery is primarily shared by the Centre for Forest Conservation Genetics at the University of BC (CFCG) and the Research Innovation and Knowledge Management (RIKM) Branch of the MFR. The Provincial Tree Seed Center of the MFR Tree Improvement Branch provide ex situ seed inventory and collection planning. The GCTAC sets broad objectives and provides budget recommendations to the FGC.

The CFCG receives funding through a Transfer Agreement with the Ministry of Forests and Range Tree Improvement Branch under the LBIS Tree Improvement Program. In addition, the Centre collaborates with other groups and agencies, and seeks funding from other sources as opportunities arise. Significant adjustments in technical objectives or budgets must be approved by the GCTAC.

3.1.3 Activities and Budget

The Centre for Forest Conservation Genetics will help identify specific *in situ* and *ex situ* conservation needs and strategies, and will assist with forest certification and climate change issues as they relate to genetic conservation and management. Investments through the CFCG also allow leveraging of funds with other provincial, national, and international agencies in the area of conservation genetics. Centre staff continue to develop and manage the ClimateBC model that is now widely used for understanding climate-change impacts in forest ecosystems.

In the 2010/11 fiscal year, the Centre will receive $165,000 for projects listed in Table 1. In addition, the Centre will continue to provide expertise on climate change impacts, seed-transfer options, and ongoing planning and policy developments related to climate change.

A budget of $78,000 is allocated to the RIKM Branch for projects listed in Table 1, and the Provincial Tree Seed Centre will receive $5,000 for *ex-situ seed*lot testing and storage work

Table 1 **Conservation subprogram budget for 2010/11.** Only activities funded by the Land Base Investment Strategy account are shown here.

Project		Budget	Products
CENTRE FOR FOREST CONS. GENETICS			
Climate-change projects			
Bioclimatic envelope modelling of BEC zones and spp.	$	35,334	1 report
Testing climate-change predictions for whitebark pine	$	20,000	1 report
Conservation status and cataloguing			
Cataloguing indigenous species	$	8,000	1 report
Conservation of select interior-spruce populations	$	28,000	1 report
Genecology of Garry oak	$	5,000	1 report
Population genetics and genecology of Pacific dogwood	$	4,000	1 report
Extension and support services			
Website, communications, etc.	$	12,000	Website update & presentations
Associate Director	$	24,000	ClimateBC support; mult. proj.
Office, lab and computing	$	16,444	
UBC overhead at 8%	$	12,222	
Total for CFCG	**$**	**165,000**	
MFR RIKM BRANCH PROJECTS			
In situ conservation status of BC tree species			
Phase I: revise catalogue and gap analysis	$	20,000	1 report
Phase II: model verification - field confirmation of census #s	$	10,000	1 report
Phase III: update analysis and report	$	500	1 report
Implementation of conservation strategy			
Develop guidelines for field sampling	$	2,000	1 report
Seed collection; extension work with conservation agenci	$	30,000	Ex-situ collections for mult. Spp.
Coord. with conservation groups and volunteers			
Participation with CONFORGEN	$	500	
Meetings, travel, etc.	$	4,000	
In situ climate change work with Uof A			
Analysis, database, report	$	10,000	1 report
Inter situ management strategy			
Management plans to mitigate risk to inter situ sites	$	1,000	1 report
Total MFR Research Branch budget	**$**	**78,000**	
MFR TREE IMPROVEMENT BRANCH PROJECTS			
Seed bank testing of old lots for conservation	$	2,000	1 report
Bigleaf Maple seed storage method development	$	3,000	1 report
Total MFR Tree Improvement Branch budget	**$**	**5,000**	
TOTAL BUDGET	**$**	**248,000**	

3.2 Tree Breeding Subprogram

The Tree Breeding Subprogram focuses on the continued development of select parent trees for y7the production of seed and vegetative materials for reforestation. Tree breeding activities include selecting parents in wild stands, propagation, testing offspring, mating, establishing/maintaining/measuring trials, and technical support. Selections from wild populations are largely complete, as all breeding programs are in a testing and selection phase, or have moved on to advanced generation breeding and testing. The Subprogram also includes realized-gain trials that quantify area-based gains in timber production, and support research on pests and other issues that impact the achievement of genetic gains in timber supply and quality. Some genecology research associated with progeny tests is also carried out. The tree breeding subprogram is implemented by the MFR Research Knowledge and Information (RIKM) Branch.

3.2.1 Planning

FGC Interior and Coastal TACs and their associated Species Committees assisted with planning and strategy development for the Tree Breeding Subprogram. Through the development of species plans (Appendix 3), the TACs estimated seed demand, orchard seed production, and program needs for each SPU. Breeding, genecology, and genetics research strategies developed by MFR tree breeders were reviewed, and direction was given to ensure alignment with FGC strategic objectives and with ongoing operational needs and programs. Species Committees also review proposed budgets and progress reports for each SPU.

The budget for the Tree Breeding Subprogram was developed for individual SPU by Species Committees in January of 2010. It was then adjusted by the Manager, Forest Genetics, MFR RIKM Branch to find efficiencies and to meet the total expected Subprogram budget allocation, with input from MFR tree breeders, the FGC Program Manager, and the MFR Tree Improvement Branch Director. Final programs and budgets were reviewed and approved by the FGC on June 16, 2010. Due to staffing adjustments in the RIKM Branch, further changes to the Tree Breeding Subprogram budget was made by RIKM management.

3.2.2 Management

The MFR manages Tree Breeding Subprogram activities, and reports to the FGC. The Manager of Forest Genetics, MFR RIKM Branch, has authority for project re-allocations in support of FGC objectives. Substantial re-allocations between seed planning units or from breeding activities to technical support activities require the approval of the Director, Tree Improvement Branch and the FGC Program Manager.

3.2.3 Activities and Budget

The 2010/11 budget for the Tree Breeding Subprogram is $1.141 million, excluding salary support. This amount includes $60,000 for clonebank upgrading and maintenance at the Cowichan Lake Research Station. Table 2 contains approved budgets and key performance indicators (KPI) for breeding activities by SPU. Some adjustments to this budget will take place due to MFR staff reductions and changing circumstances on field sites.

3.3 Operational Tree Improvement Program (OTIP)

The OTIP supports FGC objectives to increase the quality and quantity of select seed produced from existing private and MFR seed orchards. It also provides technical support for orchard production and management.

3.3.1 Planning

OTIP investment is based on input from the Interior and Coastal TACs (see Appendix 3) and on species plans that outline seed production strategies within each SPU. Based on these strategies, and on priority lists approved by the TACs, a formal call for proposals is issued.

FGC committees review and rank all proposals against FGC objectives and SPU priorities, based on technical merit, impact, value, and cost. OTIP projects are selected to increase the genetic gain in seed made available for reforestation and to increase the quantity of seed produced from existing orchards. They support FGC short-term objectives for gains in the growth rate, pest resistance, and wood quality of reforestation materials. They also support FGC long-term

objectives through the replacement of trees in existing seed orchards with trees of higher genetic value. The total budget allocation for OTIP is recommended by the FGC to the provincial Chief Forester and LBIS administrators in the MFR.

3.3.2 Management

The MFR Tree Improvement Branch administers OTIP in accordance with recommendations from the FGC. Requests for re-allocations or for new funding are handled by the MFR Tree Improvement Manager of Business Operations in consultation with the appropriate TAC and the FGC Program Manager. All projects report on key performance indicators to enable tracking of planned activities.

3.3.3 Activities and Budget

The 2010/11 OTIP budget is $684,000. Table 3 outlines approved OTIP budgets and performance indicators for all seed planning units.

3.4 Expansion of Orchard Seed Supply Subprogram (SelectSeed Co. Ltd.)

This subprogram was established in 1999 to address a need for seed orchard capital investment to meet FGC objectives. For seed planning units (SPU) with insufficient orchard capacity, as determined by the ITAC and CTAC at the time, orchard-expansion investments were initiated through SelectSeed Company Ltd. using competitive bids and long-term contracts.

SelectSeed is wholly owned by the Forest Genetics Council through the B.C. Forest Genetics Society. All Society members are on Council. The SelectSeed Board of Directors is elected by Society members (Figure 3). SelectSeed's mission is to "support Forest Genetics Council objectives for the development of seed orchard facilities to meet the provincial demand for high quality, genetically adapted tree seed through investments, cooperative work with FGC members and effective program management."

Figure 3 Organizational relationships among SelectSeed Ltd., Land Base Investment Strategy, Forest Genetics Council, and the B.C. Forest Genetics Society

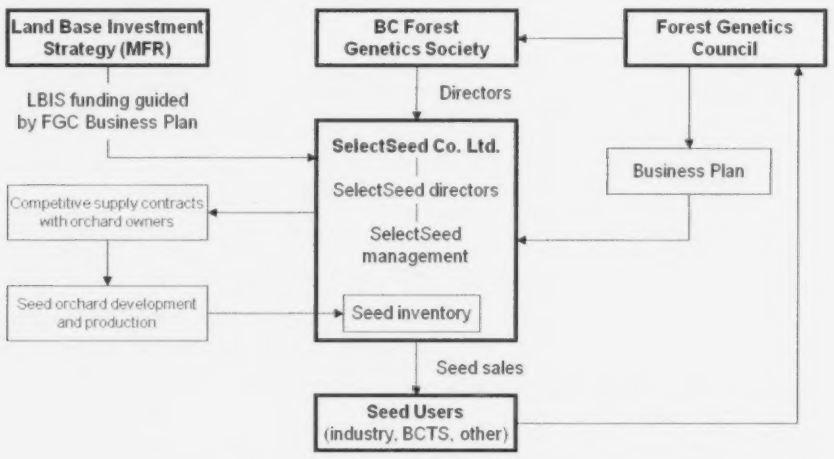


Table 2 **2010/11 budgets ($ x 1000) and KPI by seed planning unit for tree breeding and associated technical support activities.**
See Species Plans (Appendix 3) for more detail on seed planning units. Category numbers relate to Work Breakdown Structure (Figure 5).

Seed Planning Unit				*220 Selection and Breeding*								*230 Progeny testing*										*240 Technical Support*								Total $ x 1000
				211		221		222		223		231		232		233		234		235		240-1		240-2		240-3		240-4		
				# genotypes selected		# genotypes establ. in arboreta / archives		# genotypes maint. in breeding arboreta		# crosses made		# test sites sown		# progeny sites establ. / prepped		# progeny test sites maintained		# of progeny sites assessed		# of test sites analyzed		Projects								
#	Spp.	SPZ	Elev (m)	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	
1	Fdc	M	1-700	10	3	50	5	100	5	8	6			5	2	19	20	6	30			1	10							81
2	Cw	M	1-600			100	3	200	2	150	10	2	8	2	12	12	40	12	35			1	8							118
3	Hw	M-S	1-600	50	1	125	1	150	1							9	28	5	20	5	1	5	10							62
4	Sx	NE	1000-1500							100	5					3	6	3	25											36
5	Sx	NE	1500-1900																											0
6	Ss	M	1-500					200	24							8	36	3	22			1	6	1	6					94
7	Pli	NE	700-1400			50	1	250	6									6	17											24
8	Pw	M/SM	1-1400	60	0	120	10	300	10	120	10					12	24	1	24			1	40							118
9	Ba	M	1-1000																											0
10	Pli	TO	700-1400													3	15	11	22			4	12							49
11	Yc	M	1-1100			100	2	200	3	0	5					3	30	0	25											65
12	Pli	PG	700-1200													3	8	3	2			6	18							28
13	Lw	NE	700-1400					2,000	20	100	5					3	6	3	12			3	12	3	3					58
14	Sx	PG	600-1200													5	10	5	50			4	15							75
15	Pw	KQ	500-1400			40	2	100	6	25	2							5	13											23
16	Pli	TO	1400-1600																											0
17	Pli	BV	700-1200													3	6	3	2											8
18	Pli	CP	700-1100															9	10											19
19	Fdc	SM	400-1200													3	2													2
20	Pli	NE	1400-2000																											0
21	Fdi	NE	400-1000							100	5					4	4	4	24					1	2					35
22	Fdi	NE	1000-1600							100	5																			5
23	Sx/Ss	SM/NST	all																											0
24	Hw	M	600-1100													6	17	4	18	4	1									36
25	Sx	EK	750-1700													2	4					1	4							8
26	Pli	PG	1200-2000																											0
27	Cwr	SM	200-1000													5	5	5	7											12
28	Sx	TO	1300-1900																											0
29	Pli	EK	1500-2000																											0
30	Sx	TO	700-1300																											0
31	Fdc	M	700-1200																											0
32	Pli	EK	800-1500																											0
33	Cwr	SM	600-1500													4	8	4	8											16
34	Lw	EK	800-1500							100	5					7	14	7	38											57
35	Sx	BV	500-1200																											0
36	Bg	M	1-700																											0
37	Fdi	QL	700-1200													4	4	4	24											28
39	Fdi	EK	700-1400																											0
40	Sx	PR	650-1200																											0
41	Fdi	PG	700-1000													4	4	4	20											24
42	Sx	PG	1200-1550																											0
43	Fdi	CT	600-1200																											0
44	Sx	NE	1-1000																											0
45	Pli	BB/CHL	all																											0
46	Bl	all int.	all																											0
47	Bn	M	all																											0
48	At/Ep/Ct	interior	all																											0
49	Dr/Ct/Mb	Coast	all																											0
50	Lw	NE	1200-1800																											0
51	Yp	S.Int.	300-1200																											0
	Clonebank maintenance and upgrades at the Cowichan Lake Research Station																													60
	Risk managed																													0
	Totals			120	4	585	24	3,500	77	803	58	2	8	7	14	122	291	107	457			27	135	5	11	0	0	0	0	1,141

Table 3 **2010/11 budgets ($ x 1000) and KPI by seed planning unit for OTIP projects.**
Category numbers relate to the Work Breakdown Structure shown in Figure 5. See species plans (Appendix 3) for SPU detail.

Seed Planning Unit				*320 Quality / Quantity Boosts*														*340 Pest Management*						*350 Tech Support*		Total
				321		322		323		324		325		326		327		331		341		342		343				
				# ramets grafted		# ramets in holding		# ramets replaced in orchards		# ramets rogued in orchards		# ramets treated with SMP and CP		# ramets induced for cone production		# ramets managed in orchards		# donor plants for cutting prod		# ramets treated for insects		# ramets treated for disease		# ramets monitored for pests		# of reports		$x1000
#	Spp	SPZ	Elev (m)	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	KPI	$	$
1	Fdc	M	1-900	1340	6	1000	2	889	4	492	4	1831	9	750	2	8850	17			5050	4			4978	0	1	7	55.2
2	Cw	M	1-700	321	1	676	2	69	1			308	2	58	0	572	3			743	2			264	0			9.7
3	Hw	M	1-600													744	1			744	1							2.6
4	Sx	NE	1000-1700			111	0	4	0			792	1	944	3	279	1			2050	8	2050	1	2050	1	1	14	29.4
5	Sx	NE	1700-2100			143	0	5	0			663	1	221	1	252	1			1880	7	1880	1	1880	1			12.0
6	Ss	M	1-500									551	3			327	1			551	1							4.9
7	Pli	NE	700-1600	90	1	598	1	97	1	20	0	3663	6			1309	3			9271	25	4828	3	11758	8	15	33	81.2
8	Pw	MSM	1-1000	120	1											657	3											3.6
9	Ba	M	1-1000																									0.0
10	Pli	TO	700-1400	170	1	80	0	136	0	50	1	7022	8			810	1			7048	10	2341	1	7048	3			26.5
11	Yc	M	1-1100													6920	4	9720	10	8040	0					2	13	26.9
12	Pli	PG	700-1400	1000	9	2000	4	4000	52			3000	8			5596	13			16253	15	5476	4	20948	7	1	1	112.2
13	Lw	NE	700-1600													414	1			1325	9	1654	1	1654	1			11.3
14	Sx	PG	600-1400																	3079	5					1	6	10.2
15	Pw	KQ	500-1400	150	2	68	0	78	1			1861	6			562	1			3435	18	2678	1	2466	3			32.6
16	Pli	TO	1400-1600									3902	4			3504	0			3902	3	3902	0	3902	1			9.2
17	Pli	BV	700-1400	2500	24	3000	6			196	7	8315	10			4113	10			11746	16	2552	3	22934	8			84.1
18	Pli	CP	700-1300									7652	10			880	6			10186	11	1180	1	12829	5	1	1	33.8
19	Fdc	SM	200-1000	150	1					348	4	105	1			717	4			717	0							9.8
20	Pli	NE	1600-2000																									0.0
21	Fdi	NE	400-1200																									0.0
22	Fdi	NE	1000-1800									1425	4	475	2	760	2			3038	11	3038	1	2000	1			20.2
23	Sx/Ss	SM/NST	all																									0.0
24	Hw	M	600-1100			43	0	3	0			2328	6	1700	3	428	2			1671	8			1200	1			19.6
25	Sx	EK	750-1900																									0.0
26	Pli	PG	1400-2000																									0.0
27	Cw	SM	200-1000																									0.0
28	Sx	TO	1300-2100									1513	5	550	3					1513	3			1513	1			11.7
29	Pli	EK	1500-2000																									0.0
30	Sx	TO	700-1500																									0.0
31	Fdc	M	900-1200	27	0	40	0	15	0			232	1			232	1			272	1							3.0
32	Pli	EK	800-1500									1279	4			599	1			4130	8	2397	1	2000	1			15.2
33	Cw	M	700-1500																									0.0
34	Lw	EK	800-1700																									0.0
35	Sx	BV	500-1400			469	1	2	0			465	2	1789	5	176	0			2739	5	2739	1	2739	2			16.2
36	Bg	M	1-700																									0.0
37	Fdi	QL	700-1400									481	3	343	1					338	0			1185	1			5.9
39	Fdi	EK	700-1400									246	1			246	1			983	2	983	0	983	1			4.6
40	Sx	PR	650-1200			200	0					1400	2			1200	3			3795	1	3795	1	3795	2			9.3
41	Fdi	PG	700-1200									460	3			460	1			510	0			1075	1			5.9
42	Sx	PG	1200-1550																	1017	1			1017	1			2.0
43	Fdi	CT	600-1400									400	1	400	1					962	1			962	1			4.0
44	Sx	NE	1-1000									541	1			225	1			900	5	900	0	900	1			7.6
45	Pli	BB/CHL	all																									0.0
46	Bl	all int.	all																									0.0
47	Bn	M	all																									0.0
48	At/Ep/Ct	interior	all																									0.0
49	Dr/Ct/Mb	Coast	all																									0.0
50	Lw	NE	1200-1800																									0.0
			Totals	5868	45.3	8428	18.5	5298	59.2	1106	15.6	50435	101.0	7230	19.9	40832	82.0	9720	9.9	107888	184.4	42393	20.8	112080	50.3	22	73.5	680.4
																										Risk managed		0
																										Total	$	680.4

3.4.1 Planning

SelectSeed's Business Plan and investments are based on the long-term and annual business plans prepared by the FGC and its associated committees. Species plans (Appendix 3) contain analyses of projected orchard expansion needs that guide SelectSeed investments. Specific technical advice is sought as required from Species Committees or others.

3.4.2 Management

Management discretion for spending lies with the SelectSeed Board of Directors, and is limited by the terms of the SelectSeed Multi-Year Agreement with the MFR. Investments in new orchards followed a request for proposals (RFP) process, with emphasis on both the technical quality of developments and on cost. SelectSeed's annual business plan was approved by the Forest Genetics Council on March 25, 2010.

3.4.3 Activities and Budget

In 2010/11, SelectSeed will continue to focus on the management of 11 long-term orchard agreements covering the development and operation of 14 orchards (Table 5). No new orchard agreements are anticipated during the year.

Seed orchard management and development activities for the fiscal year include planting 90 ramets in orchards, and the propagation and holding of 200 ramets. A total of 35,147 ramets are planned across all 14 orchards. The total number of established ramets is approximately 34,900, with ongoing mortality due to pests and other causes removing approximately 150 ramets per year. All grafting and holding work is done through contracts. Seed production for 2010 is forecast at 31 kilograms of lodgepole pine, 17 kilograms of Douglas-fir, and 8 kilograms of spruce. Expected gross revenue from seed sales are forecast at $350,000.

Other activities will include program management on behalf of the Forest Genetics Council, including Business Plan and budget development, committee support, managing program development and subprogram interactions, and preparation of mid-term and annual reports.

Spending for 2010/11 is projected at $1,014,400, of which $543,000 will be supported through LBIS funds allocated in 2010/11. The remaining $121,400 will come from cash reserves plus a small amount from return on investments. Seed production forecasts are based on long-term production curves for similar orchards, but annual production can vary widely.

Table 4 **SelectSeed Company Ltd. 2010/11 budget by category**

Category	expenses / income
Expenses	
Existing orchard management contracts	542,500
Propagation and holding	5,000
Management and FGC support	259,300
NSERC Industrial Chair support	55,000
Crop production / seed extraction	152,600
Total expenditures	$1,014,400
Income	
Seed sales	350,000
Interest from investments	8,000
Total income	$358,000
Cash from reserves	$113,400
Total MYA support	**$543,000**

Table 5 **Orchards under contract to SelectSeed Company Ltd.**

Seed planning unit				
SPU#	**Species**	**Seed zone**	**Planned # ramets**	**Location**
21	Fdi	NE low	2187	Armstrong - Grandview
37	Fdi	QL	776	Vernon
41	Fdi	PG	786	Vernon
28	Sx	TO high	1056	Armstrong - Eaglerock
30	Sx	TO low	454	Armstrong - Eaglerock
7	Pli	NE low	1000	Armstrong - Grandview
10	Pli	TO low	4796	Armstrong - Grandview
12	Pli	PG low	4884	Kettle Valley
12	Pli	PG low	4500	Vernon
16	Pli	TO high	3508	Armstrong - Eaglerock
17	Pli	BV low	3000	Vernon
17	Pli	BV low	3100	Sorrento
18	Pli	CP low	2000	Sorrento
18	Pli	CP low	3100	Kettle Valley
		TOTAL	35,147	

3.5 Extension and Communication

The Extension and Communication Subprogram supports FGC goals and objectives through:

- extension (providing client-focused solutions and training to seed users and tree improvement specialists),
- communication (developing and disseminating information on the program and its activities to all FGC target audiences),
- training (fostering support for the education of tree improvement specialists and technologists, including continuing education).

3.5.1 Planning

Extension and communication activities are developed and guided by the FGC Extension Technical Advisory Committee (ETAC). ETAC includes representatives from operations (MFR and industry), MFR research, and the private consulting community.

The ETAC extension and communication strategy is based on three broad goals:

7. To work closely with Council and its TACs to coordinate and manage extension efforts in support of Council's provincial forest genetic resource management (tree improvement) program.
8. To provide information and policy advice to Council on issues related to extension
9. To act as a forum for user feedback.

3.5.2 Management

ETAC identifies goals and audiences for extension, communication and education activities, and with the assistance of an Extension Coordinator from the MFR – Tree Improvement Branch, develops a business plan. The Coordinator is responsible for the management of ETAC activities, and the coordination of ETAC work in conjunction with Council and other committees of Council. Projects are undertaken through contracts or through direct delivery by cooperators. Budget development for LBIS funds is first done by the ETAC, with final approval by the FGC. Project spending is approved by the ETAC Chair and the FGC Program Manager, and must meet administrative guidelines set out for LBIS funds. ETAC reports to Council on activities, progress, and spending at mid-year and year end.

3.5.3 Activities and Budget

The extension and communication budget for 2010/11 is $20,500. In-kind, staff time and other contributions by affiliated companies and agencies are incremental to this amount and are not listed. Projects and budgets are summarized in Table 6.

Table 6 Extension and communication projects and budgets for 2010/11

Project	Budget ($)
ETAC meetings and presentations	500
TIC*talk* newsletter	2,000
Western larch field tour	1,000
Extension note – Douglas-fir realized gain	2,000
Deer-resistant redcedar workshop	2,000
Nutrient analysis workshop	1,500
Coastal white pine mini-conference	2,000
Seed and seedling workshops	3,000
Cone handling workshops	2,000
Conservation publications	2,500
Administration and opportunities	2,000
Total	**$20,500**

3.6 Genetic Resource Decision Support Subprogram

The Genetic Resource Decision Support Subprogram (GRDS) supports FGC goals and objectives through the development of genetic information management systems. These systems assist clients in decision making, seed policy and planning, seed use (registration, storage, selection & use, and transfer), timber supply analysis, effectiveness evaluation and monitoring and other GRM activities.

3.6.1 Planning

GRDS projects are developed and guided by the Genetic Resource Decision Support steering committee comprised of ministry, industry and academic representatives.

3.6.2 Management

The GRDS Steering Committee, led by the Ministry of Forests and Range, Tree Improvement Branch, identifies short- and long-term goals that support clients GRM information needs. Significant project changes or re-allocations of funds from the approved Business Plan require approval of the Steering Committee and the FGC Program Manager on behalf of the FGC.

3.6.3 Activities and Budget

This subprogram is currently under review and no projects are planned for the 2010/11 fiscal year.

3.7 Cone and Seed Pest Management Subprogram

The Pest Management Subprogram supports FGC objectives by reducing orchard seed losses to insect and disease pests through research, technical support, and the development of integrated pest management strategies in conjunction with orchard managers and pest management research and extension specialists.

3.7.1 Planning

The Subprogram is guided by a Pest Management Technical Advisory Committee (PMTAC), with membership from industry, the MFR, the Canadian Forest Service, and universities. Issues are identified and ranked by the PMTAC based on perceived impact on seed losses, and the effect of these seed losses on FGC objectives. The TAC also makes recommendations to Council regarding subprogram organization and management.

3.7.2 Management

With direction from the PMTAC, research proposals were developed by the pest management scientist and pest management specialists supported through the subprogram. These were subsequently reviewed by Pest Management TAC members, and recommendations made for project modifications and acceptance.

The MFR Tree Improvement Branch manages the financial administration of projects approved by the PMTAC through in-branch allocations, or through allocations to the MFR RIKM Branch. Significant priorities and changes during the fiscal year will be made in consultation with the TAC and require approval by the FGC Program Manager and the MFR Tree Improvement Financial Administrator.

3.7.3 Activities and budget

The total Pest Management subprogram budget for 2010/11 is $162,000. In-kind, staff time and other contributions by affiliated companies and agencies are incremental to this amount. Projects and budgets are summarized in Table 7.

Table 7 Cone and Seed Pest Management Subprogram projects for 2010/11.

Project	Species impacted	Budget ($)	Products
Research lab operations (MFR – RIKM Branch)	All species	13,700	Progress report
Dioryctria coneworm reproductive behaviour (UAb)	Sx, Fdi, Fdc, Lw, Pw	10,500	Progress report
Leptoglossus seed bug behaviour (UNBC)	All except Cwr & Yc	8,500	Progress report
Leptoglossus seed bug usage of infrared & visible light (SFU)	All except Cwr & Yc	34,000	Progress report
Pesticide trials in Fdi & Sx (CHAR, PMRA)	Fdi, Sx	32,000	Progress report
Interior extension operations (MFR – Tree Imp. Branch)	All interior	25,000	Pest extension reports
Contrinia cone midge behavior and management	Fdi, Fdc, Lw	38,300	Progress report
Total budget		**162,000**	

3.8 Genecology and Seed Transfer Subprogram

The FGC implemented the Genecology and Seed Transfer Subprogram purpose is to effectively direct funding to priority genecology and seed transfer projects in support of FGC strategic objectives and provincial seed transfer policy development.

3.8.1 Planning

The subprogram is guided by the Seed Transfer TAC (STTAC), with representation from stakeholders from the MFR, industry, and universities. Priorities for genecology and seed transfer information needs are set within the context of other work currently underway, such as in the Breeding subprogram, existing genecology trials, and seed transfer policy needs. The STTAC leads the development of a call for proposals for projects and makes recommendations to the FGC regarding budgets, priorities, and delivery process.

3.8.2 Management

The STTAC developed a list of priorities for genecology and seed transfer projects by species and type of work. Based on these priorities, a call for proposals was released by the MFR Tree Improvement Branch (TIB). Proposals were screened by a review committee of the STTAC and funding recommendations were made to the FGC. The FGC reconciled funding among subprograms and made a final decision regarding which projects will be supported.

The MFR Tree Improvement Branch manages financial administration for approved projects through contracts or allocations to the appropriate MFR Branch. Project financial and progress reporting is managed through the TIB, and incorporated in annual FGC reports.

3.8.3 Activities and budget

The total budget allocated to the Genecology and Seed Transfer Subprogram for 2010/11 is $436,000, in support of 23 projects (Table 8).

Table 8 Genecology and Seed Transfer Subprogram projects, recommended funding, and performance indicators (KPI)

Species	Project Title	Budget ($)
Multiple	Development of a climate based seed transfer system for changing climates	$ 53,508
Sub-alpine fir	Patterns in frost, heat, and drought response of Abies lasiocarpa and Abies amabilis populations from a range of climates	$ 6,300
Multiple	Patterns in frost, heat, and drought response of Abies lasiocarpa and Abies amabilis populations from a range of climates	$ 38,745
Coastal Douglas-fir	Seed transfer study in the coastal Douglas-fir sub-maritime zone: final measurements	$ 23,730
Lodgepole pine	Assessment of lodgepole pine provenance variation for Mountain Pine Beetle and secondary bark beetle attacks	$ 20,771
Western Larch& redcedar	Climatic response of western redcedar and western larch seed source using controlled climate chambers	$ 42,219
Int. spruce	Interior spruce seed transfer and assisted migration	$ 51,200
Multiple	Assessment of off site tree plantations in the Northern Interior Forest Region	$ 38,325
Int. redcedar	Western red cedar interior climate change and seed transfer study	$ 5,400
Int. Douglas-fir	Trinity Valley range-wide Douglas-fir provenance test: 35 year maintenance and measurement	$ 10,000
Western hemlock	Refining western hemlock seed transfer to optimize productivity for seed sources based on genecology trial results	$ 32,625
Western Larch	Lamb Creek range-wide western larch provenance test: 20 year maintenace and measurement	$ 8,000
Aspen	Genecology of Aspen in British Columbia	$ 24,000
Sub-alpine fir	EP0824 - Provenance Studies of Subalpine Fir	$ 18,000
Multiple	Quantifying impacts of climate change on forest health of BC indigenous tree species	$ 3,000
Paper birch	Provenance test variation for paper birch in the interior of British Columbia for the development of transfer functions for a Climate Based Seed transfer	$ 20,950
Pacific silver fir	EP0824 - Provenance Studies of Pacific Silver Fir	$ 14,000
Coastal Douglas-fir	Coevolution of ectomycorrhizal fungal communities with local provenances of coastal Douglas -fir and the implications for assisted migration	$ 11,900
Black cottonwood	Black Cottonwood genecology study	$ 12,000
Grand fir	EP0823 - Provenance Studies of Grand Fir	$ 1,000
	TOTAL	**$ 435,673**

3.9 Administration

Administration of the LBIS Tree Improvement Program is provided by the Tree Improvement Branch of the MFR. There are three components to this work:

- the administration of LBIS funds allocated to subprograms managed by the MFR, including Tree Breeding, OTIP, Genecology and Seed Transfer, Extension and Communication, Pest Management, and Genetic Resource Information Management,
- the administration of contracts with successful proponents through the OTIP, Genecology and Seed Transfer proposal calls, and with universities and SelectSeed Company Ltd.,
- support for the business of the FGC, including scheduling meetings, assistance with information distribution, and dealing with queries and planning.

3.9.1 Costs

MFR administration costs are reviewed by the FGC, and a recommendation is made for support under LBIS. The administration budget is approved by the FGC in conjunction with other LBIS Tree Improvement Program budget items.

3.9.2 Management

Overall program management is carried out on behalf of the Forest Genetics Council by the FGC Program Manager working for SelectSeed Company Ltd. This work includes planning, coordination of committees, Business Plan development, reporting, correspondence, and representing the FGC in daily business. The MFR Tree Improvement Branch provides administrative support, overall financial management, and assistance with the coordination of FGC business.

3.9.3 Activities and Budget

The 20010/11 budget for the Administration Subprogram is $30,000. This amount includes all program administration costs incurred by the MFR Tree Improvement Branch.

3.10 Incremental Projects

3.10.1 Applied Tree Improvement and Biotechnology

The Applied Tree Improvement and Biotechnology research program carried out at the University of British Columbia received funds through the LBIS Tree Improvement Program. A steering committee provided review of ongoing research proposed through this project and provided advice on implementation. The total allocation to this project for 2010/11 is $122,000. Parental gametic contributions in western larch and Douglas-fir seed orchards seed orchards and estimation of co-ancestry in yellow cypress.

3.10.2 Incremental Call for Proposals

An incremental call for proposals was issued in March 2010. This call received 36 proposals, 11 of which received funding total or partial funding support. Projects listed in Table 9 were approved

by the FGC based on the recommendations of a review committee, and are supported through LBIS Tree Improvement Program funds. Only approved projects are listed in Table 9. Contracts or funding transfers follow the same procedure as was used for OTIP projects (see section 3.3).

Table 9 2010/11 incremental projects and budgets ($ x 1000).

Species	Project	Budget
Lodgepole pine	Red turpentine beetle treatment in 2 Pli seed orchards in the north Okanagan	9,937
Lodgepole pine	Red turpentine beetle treatment in 4 Pli seed orchards in the north Okanagan	22,500
Lodgepole pine	Red turpentine beetle treatment in 5 Pli seed orchards in the north Okanagan	32,500
Lodgepole pine	Red turpentine beetle treatment in 5 Pli seed orchards in the north Okanagan	25,773
Lodgepole pine	Red turpentine beetle treatment in 2 Pli seed orchards in the north Okanagan	9,515
Lodgepole pine	Research trial management and removal of red turpentine impacted Pli on the Skimikin seed orchard site	4,000
Sitka spruce	N. Coast Ss/Sxs weevil hazard assessment tool	4,000
Yellow cedar	Measure Yc clonal trials (part of full proposal)	17,440
Whitebark pine	Support Pa planting in Ft. Nelson and Manning Pk.	1,000
Interior spruce	Sx clonebank maintenance	4,603
Yellow cedar	Yc provenance tial measurements	12,232
	Total	**143,500**

3.11 Budget Summary

A Land Base Investment Strategy Tree Improvement Program budget allocation of $3.53 million is approved for the 2010/11 fiscal year, and is summarized in Table 10.

Table 10 2010/11 budget summary for LBIS Tree Improvement Program contributions to subprograms ($ x 1000).

Subprogram	Allocation ($ x 1000))
Genetic Conservation	248
Tree Breeding	1,141
Operational Tree Improvement Program (OTIP)	684
Extension and Communication	20.5
Genetic Resource Information Management	0
Seed Orchard Pest Management	162
Expansion of Orchard Seed Supply (SelectSeed Ltd.)	543
Genecology and Seed Transfer	436
Applied Tree Improvement and biotechnology (UBC)	122
Incremental projects (see table 9)	143.5
Administration (Tree Improvement Branch)	30
Total	**3,530**

4.0 Funding and Administrative Mechanisms

This section outlines the agreements through which the Land Base Investment Strategy, Tree Improvement Program funds activities through this FGC Business Plan.

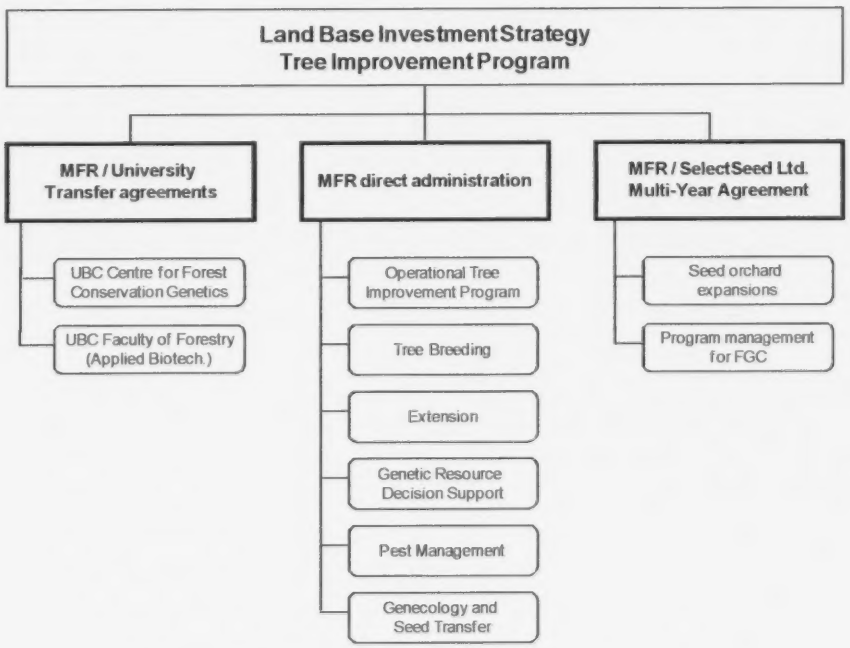
4.1 Funding Agreements

The Land Base Investment Strategy Tree Improvement program is administered by the Tree Improvement Branch of the Ministry of Forests and Range. FGC Business Plan activities are supported through the following administrative mechanisms:

- MFR/SelectSeed Co. Ltd. Multi-Year Agreement and Transfer Letter
- MFR contracts
- MFR/University Transfer Agreements
- MFR direct management and administration

The subprograms associated with each of the mechanisms are shown in Figure 4. Resources from other agencies include in-kind facilities, staff and direct funds. Seed sales from orchards also provide revenue to support seed production. Only Land Base Investment Program funding is detailed in this Business Plan.

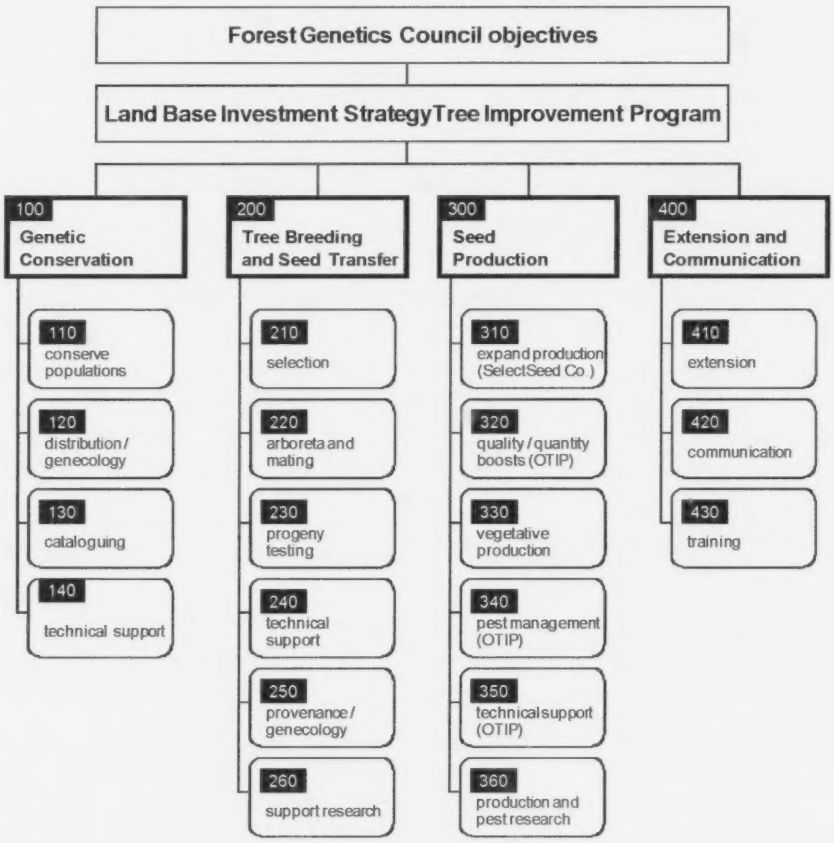
Figure 4 **Administrative mechanisms for the delivery of the LBIS Tree Improvement Program funding.**



4.2 Monitoring and Reporting

Monitoring progress is an important objective of the FGC program. All LBIS funded activities report on performance relative to criteria. In addition, progress is measured at the provincial level for all FGC activities to determine progress towards long-term objectives. To facilitate monitoring, activities are categorized using the work breakdown structure shown in Figure 5.

Figure 5 Work breakdown structure for program administration, monitoring and management.



4.2.1 Reporting for the Genetic Conservation, Extension and Communication, and Genetic Resource Information Management Subprograms

For the Genetic Conservation, Extension, and Genetic Resource Decision Support subprograms, the TAC chair or subprogram leader will submit written reports on activities and spending to the MFR Tree Improvement Program Administrator on or before October 30, 2010 and April 30, 2011.

4.2.2 Reporting for the Tree Breeding, OTIP, SelectSeed, and Genecology and Seed Transfer Subprograms

Progress for the Tree Breeding, OTIP, SelectSeed, and Genecology and Seed Transfer subprograms will be summarized using key performance indicators (KPI) and spending.

Progress towards FGC objectives for increasing genetic worth and increasing the use of orchard seed will be reported using provincial summaries. SelectSeed Company Ltd. will produce an annual report showing performance indicators, financial statements, and audit reports.

4.2.3 Project-Level Reporting

Project activities are organized into the categories identified in the work breakdown structure (Figure 5) (e.g., 320 Quality/Quantity Boosts). Individual projects (e.g., 321 grafting for ramet replacement) will report on KPIs (e.g., number of grafts made) and spending for each year of implementation. Tree Breeding and OTIP project reports will be summarized to formats shown in Tables 2 and 3, and the Genecology and Seed Transfer Subprogram will be summarized in the format shown in Table 9. Reporting for technical support projects, which are more variable in nature, will use indicators designed for each project. Where actual work or spending differs substantially from that planned, variance reports explaining the reasons will be required of project proponents. Work quality will be periodically audited through Review Committees and site visits. Reports will be received and reviewed by Technical Advisory Committees or project steering committees, as appropriate, as well as by the MFR Program Administrator and the FGC Program Manager.

4.2.4 Provincial-Level Reporting

Activities and spending will be summarized at the provincial level using KPI and budgets from project-level reports. In addition, actual progress towards FGC objectives 1, 2, 3 and 4 (see section 1.1) will be summarized at the provincial level in the FGC Annual Report to be published by October 15, 2011.

Table 11 identifies the reporting requirements.

Table 11 List of reports, responsibilities, distribution, and preparation dates for FIA-supported Tree Breeding, OTIP, Genecology and Seed Transfer, and SelectSeed projects.

Type of report	Prepared by	Prepared for	Distribution	Dates due
Interim project status	Project leader	MFR program administrators for early FY reallocations	On request	Aug 1
Project level	Project proponent	MFR Program Administrator	On request	Oct 30 April 30
Annual report and progress summary	FGC Program Manager, Program Administrator MFR; project leader contributions	FGC; MFR Chief Forester; TACs; general distribution	FGC members; TACs; FIA administrators; MFR; general distribution; FGC website	Oct 15

* Note: The Interim Project Status report is an informal report intended only to identify projects that are not progressing as planned, and for which funds may be re-allocated.

Appendix 1: Seed Planning Units and Categories

The following table lists seed planning units and their activity category. Note that SPUs are adjusted for new seed transfer standards which came into effect in the fall of 2008. Seed use numbers are shown graphically in each species plan, and reflect these new seed transfer standards.

All provincial SPUs are grouped to one of four categories using a protocol developed by the FGC Strategic Planning Committee. The protocol evaluates SPUs based on the net present value of tree improvement investments, feasibility criteria, uncertainty, opportunities, and seed transfer information needs. Listed SPUs have a Species Plan in Appendix 3, and only include SPUs falling into categories 1 to 3. Annual planting is the 5-year mean of 2006–2010 seedling requests to SPAR. Categorization for SPUs # 6, 8 and 15, are based on an expectation of increased planting with pest resistant material.

Program categories include;

1. Advanced-generation program,
2. First-generation program,
3. Genecology, and
4. No genetics program.

Seed planning unit (SPU)				Program
#	Species	SPZ	Elev. band (m)	category
1	Fdc	M	1-900	1
2	Cw	M	1-700	1
3	Hw	M	1-600	2
4	Sx	NE	1000-1700	1
5	Sx	NE	1700-2100	2
6	Ss	M	1-500	2
7	Pli	NE	700-1600	1
8	Pw	M/SM	1-1000	1
9	Ba	M	1-1000	3
10	Pli	TO	700-1400	1
11	Yc	M	1-1100	2
12	Pli	PG	700-1400	1
13	Lw	NE	700-1600	1
14	Sx	PG	600-1400	1
15	Pw	KQ	500-1400	1
16	Pli	TO	1400-1600	2
17	Pli	BV	700-1400	1
18	Pli	CP	700-1300	1
19	Fdc	SM	200-1000	2
20	Pli	NE	1600-2000	2
21	Fdi	NE	400-1200	1
22	Fdi	NE	1000-1800	2
23	Sx/Ss	SM/NST	all	2
24	Hw	M	600-1100	2
25	Sx	EK	750-1900	2
26	Pli	PG	1400-2000	3

Seed planning unit (SPU)				Program
#	Species	SPZ	Elev. band (m)	category
27	Cw	SM	200-1000	2
28	Sx	TO	1300-2100	2
29	Pli	EK	1500-2000	2
30	Sx	TO	700-1500	1
31	Fdc	M	900-1200	2
32	Pli	EK	800-1500	2
33	Cw	M	700-1500	2
34	Lw	EK	800-1700	1
35	Sx	BV	500-1400	2
36	Bg	M	1-700	3
37	Fdi	QL	700-1400	2
38	Hw	M north	1-600 (part of SPU 3)	
39	Fdi	EK	700-1400	2
40	Sx	PR	<650 & 650-1200	2
41	Fdi	PG	700-1200	2
42	Sx	PG	1200-1550	2
43	Fdi	CT	600-1400	2
44	Sx	NE	1-1000	1
45	Pli	BB/CHL	All	3
46	Bl	all int.	all	3
47	Bn	M	all	3
48	Aspen/birch/poplar	Interior	-	3
49	Alder/poplar/maple	Coast	-	3
50	Lw	NE	1200-1800	2
51	Py	S. Interior	300-1200	2

Note regarding pending Seed Zones

Seed zones are adjusted from time to time based on new research information, or on administrative needs. For information updates on seed zones, please contact Lee Charleson of the Ministry of Forests and Range Tree Improvement Branch (lee.charleson@gov.bc.ca)

Appendix 2: Forest Genetics Council and Technical Advisory Committee Members

Forest Genetics Council of BC

Name	Affiliation	Representing
Brian Barber (Co-Chair)	MFR, Tree Imp. Br.	Ministry of Forests and Range Co-Chair
Kerry McGourlick (Co-Chair)	Western Forest Products Ltd.	Industry Co-Chair
Judi Beck	Canadian Forest Service	Canadian Forest Service
Dr. Rob Guy	University of BC	Universities
Scott King	Lousiana Pacific	Southern interior industry
Joe Leblanc	Interfor Ltd.	Coast industry
Tim Lee	Vernon Seed Orchard Co.	Interior Technical Advisory Committee
Al McDonald	BC Timber Sales	Ministry of Forests and Range and BCTS
Larry Gardner	West Fraser Timber Ltd.	Interior industry orchard owners
Madeline Maley	MFR, SI Region	Ministry of Forests and Range
John Mitchell	TimberWest Forests ltd.	Coast industry orchard owners
Barrie Phillips	Research Know. and Info. Mgt. Br.	Ministry of Forests and Range
Annette van Niejenhuis	Western Forest Products Ltd.	Coastal Technical Advisory Committee
Gernot Zemanek	Roserim Forest Nursery	Woodlots and nurseries

Genetic Conservation Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Dave Kolote (Chair)	Ministry of Forests and Range	Tory Stevens	Ministry of Environment
Dr. Sally Aitken	University of BC	Dr. Tongli Wang	University of BC
Lee Charleson	Ministry of Forests and Range	Jack Woods	SelectSeed Ltd. / FGC
Dr. Scott Green	University of Northern BC	Alex Woods	Ministry of Forests and Range
Dr. Andreas Hamann	University of Alberta	Dr. Alvin Yanchuk	Ministry of Forests and Range
Jodie Krakowski	Ministry of Forests and Range		

Coastal Technical Advisory Committee Ministry of Forests and Range

Name	Affiliation	Name	Affiliation
Annette van Niejenhuis (Chair)	Western Forest Products	Siroil Paquet	Sylvan Vale Nurseries Ltd.
Dr. Sally Aitken	University of BC	David Reid	Ministry of Forests and Range
Charlie Cartwright	Ministry of Forests and Range	Dr. John Russell	Ministry of Forests and Range
Tim Crowder	TimberWest Forests	Brian Saunders	Island Timber Ltd.
Diane Douglas	Ministry of Forests and Range	Dr. Michael Stoehr	Ministry of Forests and Range
Dr. John King	Ministry of Forests and Range	Dr. Joe Webber	ProSeed Consulting
Dave Kolotelo	Ministry of Forests and Range	Dr. Chang-yi Xie	Ministry of Forests and Range
Bob Merrell	BC Timber Sales Ltd.	Dr. Alvin Yanchuk	Ministry of Forests and Range

Interior Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Tim Lee (Chair)	Vernon Seed Orchard Co.	Dave Kolotelo	MFR, Tree Imp. Branch
Dr. Michael Carlson	MFR, Research Branch	Mike Madill	MFR, SI Region
Krista Copeland	Tolko Ltd.	Al McDonald	BC Timber Sales Ltd.
Keith Cox	MFR, Tree Imp. Branch	Anna Monetta	MFR, NI Region
Vince Day	Canadian Forest Products Ltd.	Wayne Nuyens	West Fraser Timber Ltd.
Diane Douglas	MFR, Tree Imp. Branch	Greg O'Neill	MFR, Research Branch
Dan Gaudet	Vernon Seed Orchard Company	Roger Painter	SelectSeed Ltd.
Hilary Graham	Pacific Regeneration Technologies	Doug Perdue	Dunkley Lumber
Dr. Chris Hawkins	University of Northern BC	David Reid	MFR, Tree Imp. Branch
Barry Jaquish	MFR, Research Branch	Chris Walsh	MFR, Tree Imp. Branch

Extension Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Diane Douglas (Chair)	MFR, Tree Imp. Branch	Tia Wagner	Vernon Seed Orchard Co. Ltd.
Dr. Michael Carlson	MFR, Research Branch	Roger Painter	Mr. GreenGenes consulting
Charlie Cartwright	MFR, Research Branch	Debbie Poldrugovac	MFR, Tree Imp. Branch
Keith Cox	MFR, Tree Imp. Branch	Kathie Swift	FORREX
Tim Crowder	TimberWest	Dave Trotter	Min. of Agriculture and Lands
Peter Forsythe	Huckleberry Forestry Ltd.	Nick Ukrainetz	MFR, Research Branch
Laughlan Glen	BC Timber Sales Ltd.	Jack Woods	SelectSeed Ltd. / FGC
Hilary Graham	Pacific Regeneration Technology		

Pest Management Technical Advisory Committee

Name	Affiliation	Name	Affiliation
Jim Corrigan	MFR, Tree Imp. Branch	Dr. Staffan Lindgren	University of Northern BC
Tim Crowder	TimberWest Forests Ltd.	Dr. Ward Strong	MFR, Research Branch
Dan Gaudet	Vernon Seed Orchard Company	Chris Walsh	MFR, Tree Imp. Branch
Dr. Peter de Groot	Canadian Forest Service	Jack Woods	SelectSeed Ltd. / FGC

Appendix 3: Species Plans

Species plans present information for seed planning units with active or planned breeding programs, seed orchards, or genecology work, including SPUs that are not supported through LBIS Tree Improvement Program funding. Information presented includes breeding strategy (where applicable), seed orchard production forecasts, gain forecasts, historic seed use, seed in storage, genetic conservation status, and genecology/seed transfer projects. The plans are organized by species.